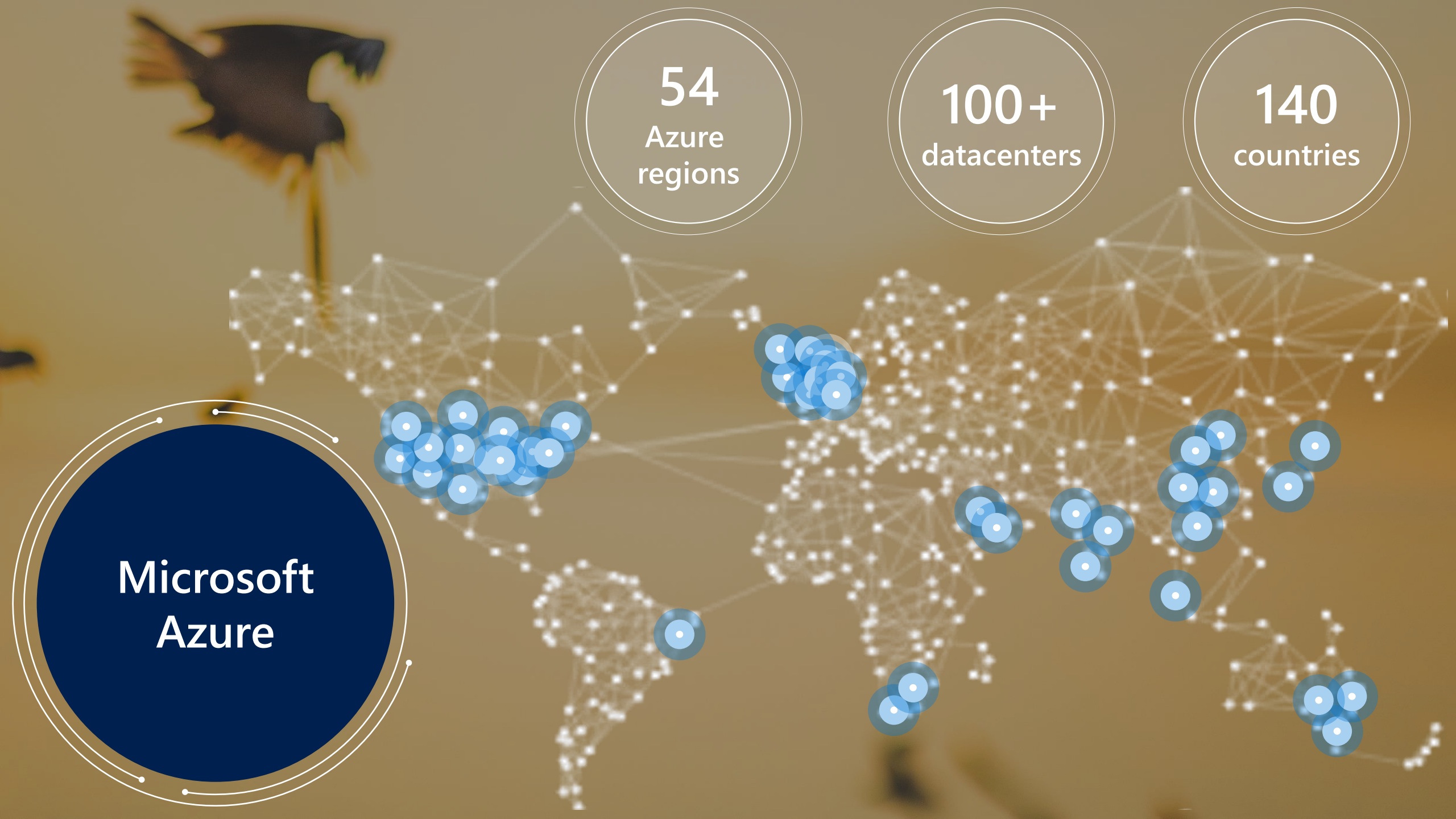
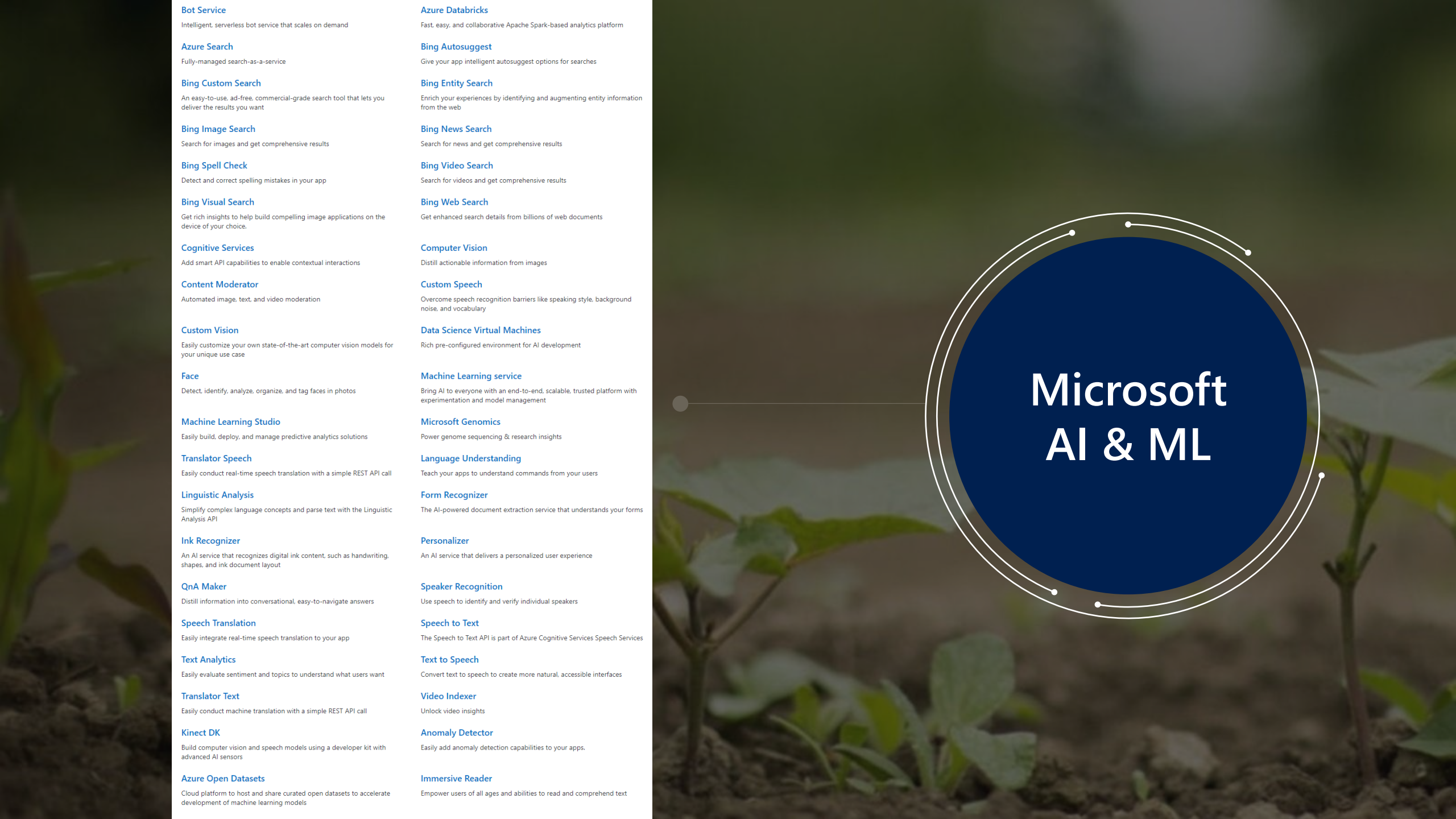
Microsoft

Cloud-based Partnerships for a Climate-stable Future

Lucas Joppa
Chief Environmental Officer, Microsoft


54
Azure
regions
100+
datacenters
140
countries
Microsoft
Azure



Microsoft AI & ML

Bot Service
Intelligent, serverless bot service that scales on demand

Azure Search
Fully-managed search-as-a-service

Bing Custom Search
An easy-to-use, ad-free, commercial-grade search tool that lets you deliver the results you want

Bing Image Search
Search for images and get comprehensive results

Bing Spell Check
Detect and correct spelling mistakes in your app

Bing Visual Search
Get rich insights to help build compelling image applications on the device of your choice.

Cognitive Services
Add smart API capabilities to enable contextual interactions

Content Moderator
Automated image, text, and video moderation

Custom Vision
Easily customize your own state-of-the-art computer vision models for your unique use case

Face
Detect, identify, analyze, organize, and tag faces in photos

Machine Learning Studio
Easily build, deploy, and manage predictive analytics solutions

Translator Speech
Easily conduct real-time speech translation with a simple REST API call

Linguistic Analysis
Simplify complex language concepts and parse text with the Linguistic Analysis API

Ink Recognizer
An AI service that recognizes digital ink content, such as handwriting, shapes, and ink document layout

QnA Maker
Distill information into conversational, easy-to-navigate answers

Speech Translation
Easily integrate real-time speech translation to your app

Text Analytics
Easily evaluate sentiment and topics to understand what users want

Translator Text
Easily conduct machine translation with a simple REST API call

Kinect DK
Build computer vision and speech models using a developer kit with advanced AI sensors

Azure Open Datasets
Cloud platform to host and share curated open datasets to accelerate development of machine learning models

Azure Databricks
Fast, easy, and collaborative Apache Spark-based analytics platform

Bing Autosuggest
Give your app intelligent autosuggest options for searches

Bing Entity Search
Enrich your experiences by identifying and augmenting entity information from the web

Bing News Search
Search for news and get comprehensive results

Bing Video Search
Search for videos and get comprehensive results

Bing Web Search
Get enhanced search details from billions of web documents

Computer Vision
Distill actionable information from images

Custom Speech
Overcome speech recognition barriers like speaking style, background noise, and vocabulary

Data Science Virtual Machines
Rich pre-configured environment for AI development

Machine Learning service
Bring AI to everyone with an end-to-end, scalable, trusted platform with experimentation and model management

Microsoft Genomics
Power genome sequencing & research insights

Language Understanding
Teach your apps to understand commands from your users

Form Recognizer
The AI-powered document extraction service that understands your forms

Personalizer
An AI service that delivers a personalized user experience

Speaker Recognition
Use speech to identify and verify individual speakers

Speech to Text
The Speech to Text API is part of Azure Cognitive Services Speech Services

Text to Speech
Convert text to speech to create more natural, accessible interfaces

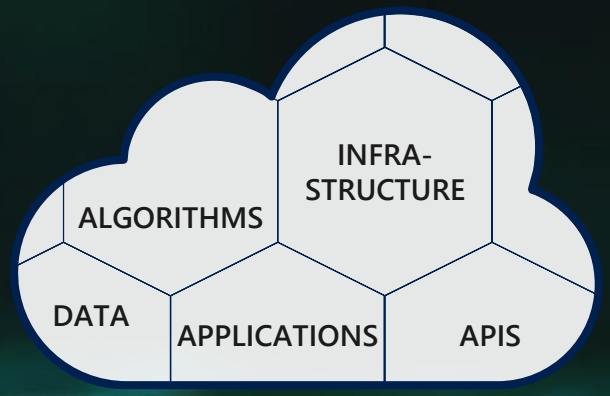
Video Indexer
Unlock video insights

Anomaly Detector
Easily add anomaly detection capabilities to your apps.

Immersive Reader
Empower users of all ages and abilities to read and comprehend text


Transform
our company
Empower
our partners

Microsoft AI Platform



Azure AI Services

PRE-BUILT AI

Cognitive Services

CONVERSATIONAL AI

Bot Service

CUSTOM AI

Azure Machine Learning

Azure Infrastructure

AI ON DATA

Cosmos DB | SQL DB | SQL DW | Data Lake

AI COMPUTE

Spark | DSVM | Batch AI | ACS | IoT Edge

CPU, FPGA, GPU

Tools

CODING & MANAGEMENT TOOLS

VS Tools for AI | Azure ML Studio | Azure ML Workbench

Others (PyCharm, Jupyter Notebooks…)

DEEP LEARNING FRAMEWORKS

3rd Party

Cognitive Toolkit | TensorFlow | Caffe

Others (Scikit-learn, MXNet, Keras, Chainer, Gluon…)

What is Cray in Azure?

Scalable, powerful infrastructure for the most demanding workloads in engineering, climate, energy, and scientific research

A dedicated, single-tenant supercomputing resource **with complete control and security over your applications, data, and hosting environment**

Integrated **ClusterStor™ high performance storage** that centralizes your data resource and eliminates spinning up additional data repositories

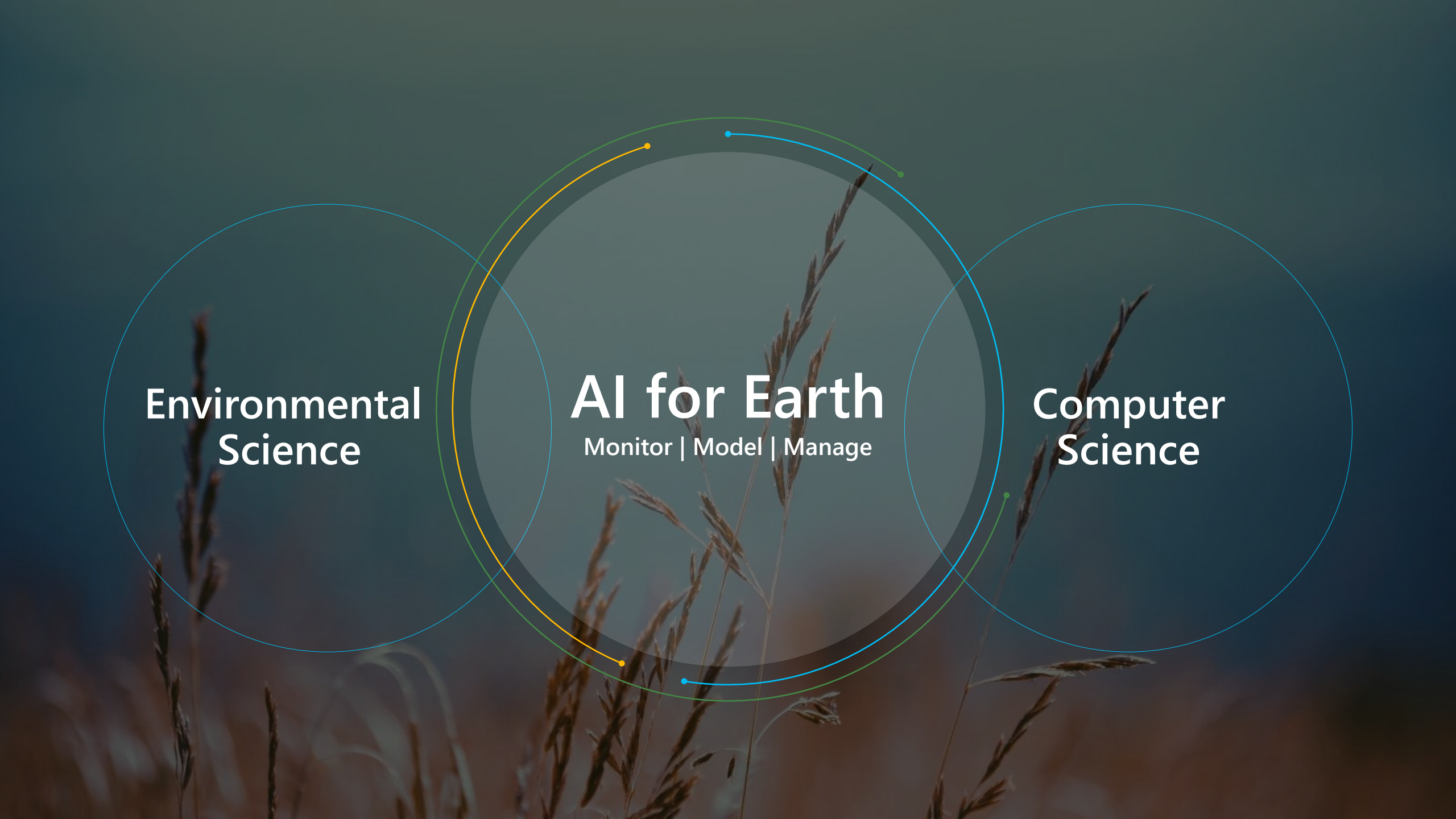
---

Built to your custom specifications so you can get the scale of the public cloud without compromising specific application, compliance, or regulatory requirements

---

Fully managed service and support by Cray specialists, integrated alongside Azure support resources for the best of both worlds

CRAY


Environmental Science
AI for Earth
Monitor | Model | Manage
Computer Science

Increase access

to cloud
and AI technologies
through grants

Provide education

on cloud and AI and
increase collaboration
through our community

Fuel innovation

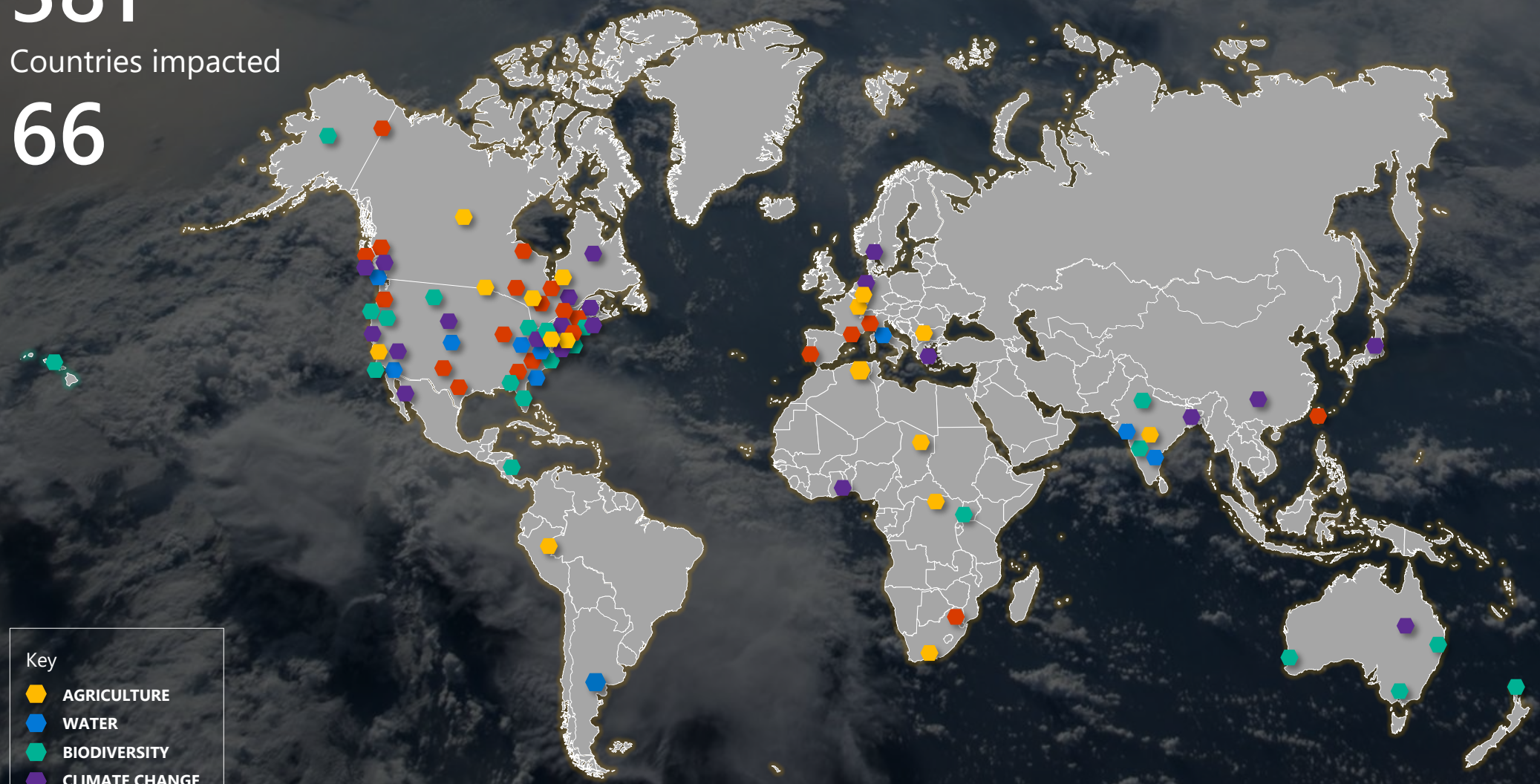
through Microsoft
research and strategic
partnerships

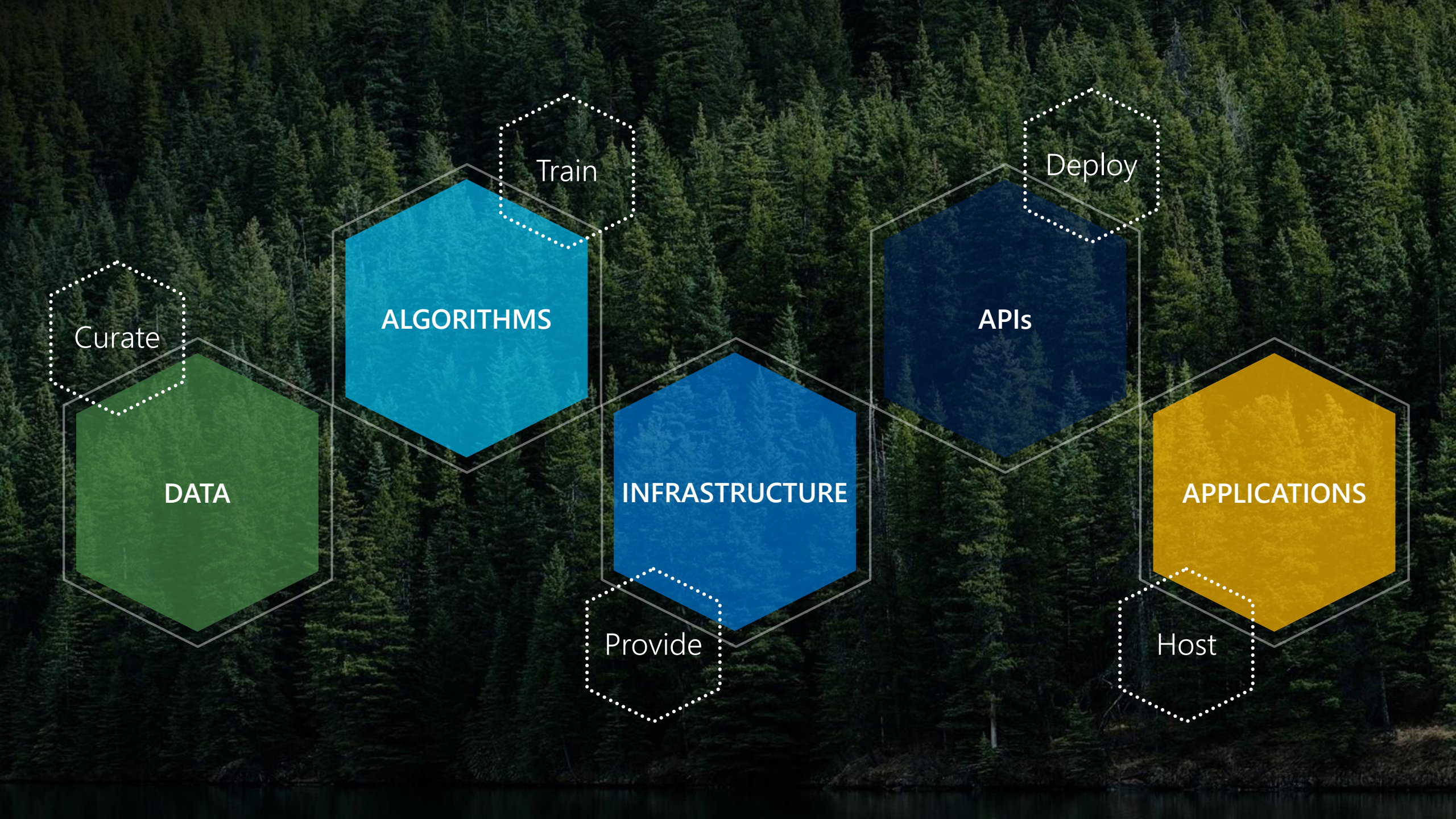
Grantees:

381

Countries impacted

66




Train
Deploy
Curate
ALGORITHMS
APIs
DATA
INFRASTRUCTURE
APPLICATIONS
Provide
Host


Demos

Azure Open Datasets PREVIEW

Curated open data made easily accessible on Azure

Start free > Explore datasets >

NOAA NEXRAD Level II

This dataset contains both current and archival level II data from the NEXRAD system.

NOAA Integrated Surface Data (ISD)

Worldwide hourly weather history data (e.g. temperature, precipitation, wind) sourced from the National Oceanic and Atmospheric Administration (NOAA).

NOAA Global Forecast System (GFS)

15-day US hourly weather forecast data (e.g. temperature, precipitation, wind) produced by the Global Forecast System (GFS) from the National Oceanic and Atmospheric Administration (NOAA).

LILA BC

Labeled Information Library of Alexandria: Biology and Conservation

WCS Camera Traps

This data set contains approximately 1.4M camera trap images representing around 675 species from 12 countries, making it one of the most diverse camera trap data sets available publicly. Data were provided by the Wildlife Conservation Society. The most...

NOAA Arctic Seals

This data set contains about one million thermal/RGB image pairs, representing a 2016 aerial survey of sea ice habitat in U.S. waters of the Chukchi Sea, conducted by NOAA fisheries. Annotations indicate the locations of approximately 7000 seals in...

Chesapeake Land Cover

Overview This dataset contains high-resolution aerial imagery from the USDA NAIP program [1], high-resolution land cover labels from the Chesapeake Conservancy [2], and low-resolution land cover labels from the USGS NLCD 2011 dataset 3 formatted to...

Snapshot Serengeti

This data set contains 1.2M sequences of camera trap images, totaling 3.2M images, from seasons one through six of the Snapshot Serengeti project. Labels are provided for 48 animal categories, primarily at the species level (for example, the most common...

Geo AI Data Science VM with ArcGIS

save for later

Microsoft

★★★★★ (0) Write a review

Overview Plans Reviews

GET IT NOW

Pricing information
Cost of deployed template components

Categories
Analytics
Databases

Support
Support

Legal
License Agreement
Privacy Policy

A geo-spatial analytics and AI extension to the Microsoft Data Science Virtual Machine

The Geo AI Data Science VM is an extension to the Windows Server 2016 edition of the Microsoft Data Science Virtual Machine (DSVM) on Azure, offered through the collaboration between Esri and Microsoft. The Microsoft DSVM contains popular tools for data science as well as AI tools, such as enterprise grade R and Python on the Microsoft Machine Learning Server, Anaconda Python, JuliaPro, Jupyter Notebook for Python, Julia and R, Visual Studio Community edition with Python and R Tools, SQL Server Developer edition, standalone instance of Apache Spark, deep-learning frameworks like TensorFlow, Microsoft Cognitive Toolkit, and several other data science tools and machine learning algorithms. See a comprehensive list of Microsoft DSVM tools and algorithms.

ArcGIS Pro is Esri's next-gen 64-bit desktop geographic information system (GIS). Technologically ahead of everything else on the market, ArcGIS Pro provides professional 2D and 3D mapping in an intuitive user interface. ArcGIS Pro is a big step forward in advancing visualization, analytics, image processing, data management, and integration.

The Geo AI Data Science VM augments the Microsoft DSVM with rich geo-spatial capabilities of Esri's ArcGIS Pro. Python and R interfaces to ArcGIS Pro are pre-configured on the Geo AI Data Science VM, enabling programmatic access to geo-spatial analytics within your AI applications out of the box. We also provide samples in the form of Jupyter notebooks to help you start building AI applications infused with geo-spatial intelligence.

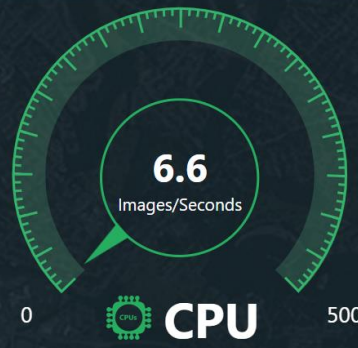
If you are building deep learning models on the Geo AI Data Science VM, we recommend you use Azure NC-Series GPU VM instances which is available in select Azure regions. Check here for availability of various services by Azure regions.

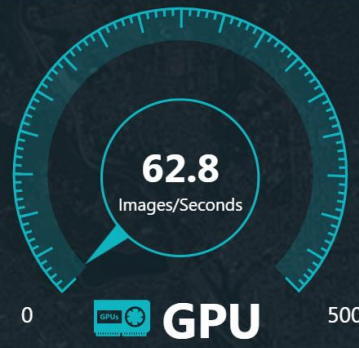
By continuing to create and use this extension, you are accepting the Esri ArcGIS Pro license agreements and the Microsoft Data Science Virtual Machine terms.

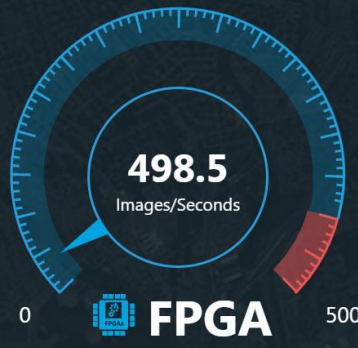
Learn more

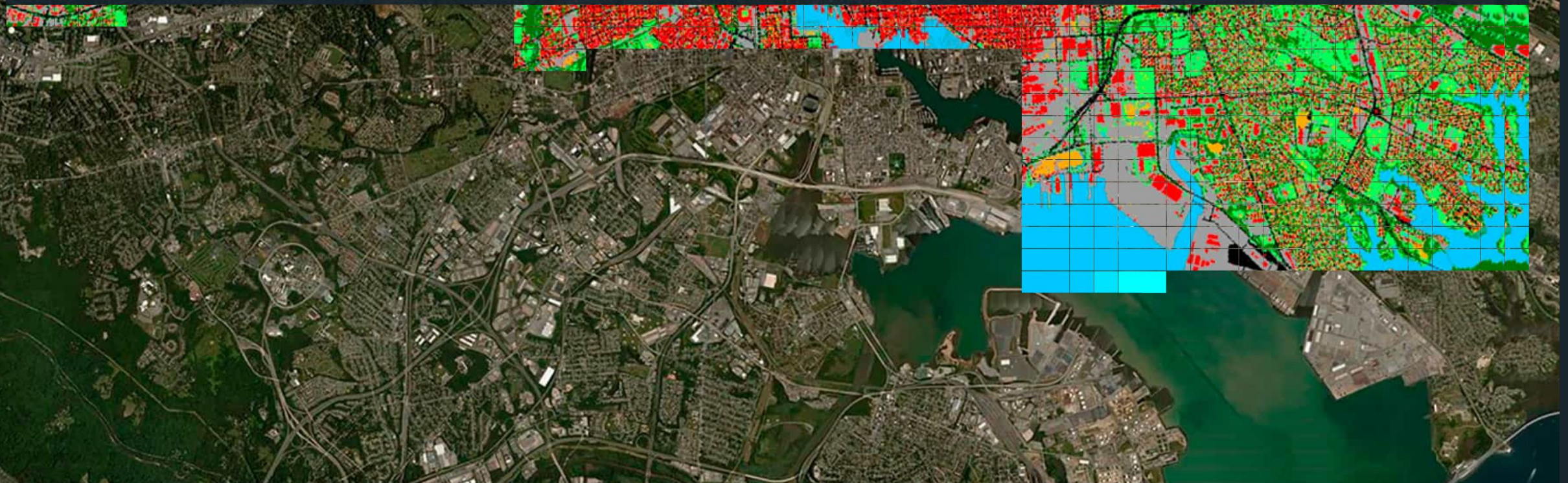
Documentation
ArcGIS Pro Help
Data Science VM Overview

// AI For Earth


6.6
Images/Seconds
0
CPU
500
STOP
1
1
10
4,751 images processed


62.8
Images/Seconds
0
GPU
5000
STOP
1
1
10
44,557 images processed


498.5
Images/Seconds
0
FPGA
500K
STOP
1
1
1000
2,573,000 images processed



Seal detection API demo

In areas with limited tree cover and large wildlife, aerial wildlife population surveys are often more efficient than surveys using camera traps or "boots on the ground". The downside of aerial surveys is that even in areas dense with wildlife, the *vast* majority of images are empty, which makes population counting laborious. In this notebook, we demonstrate the ability of a machine learning model – trained in PyTorch and hosted as an API via the AI for Earth API Platform – to detect large wildlife in an arctic environment.

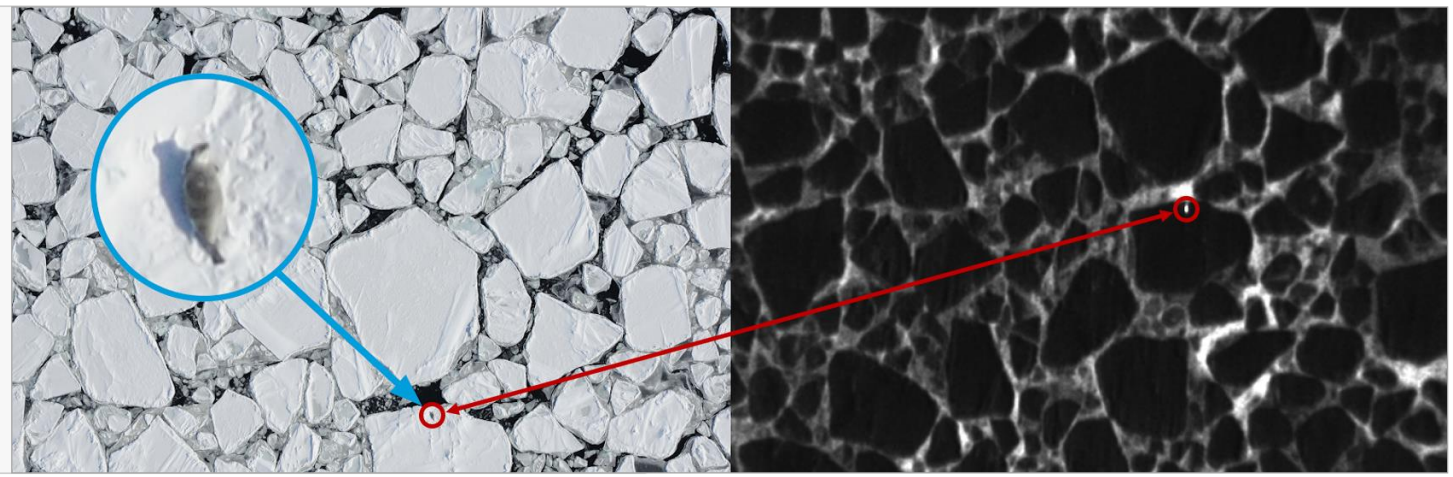
The API underlying this demo is *not* a production or public API, rather it demonstrates ongoing work and the potential for automating incredibly tedious manual annotation.

Images courtesy of NOAA. The entire training data set is available on lila.science, an collaboration between AI for Earth and several external partners to make training data available for conservation problems.

Contact dan@microsoft.com with questions.

Imports and constants

In [3]:
```
import requests
from io import BytesIO
import random
random.seed(0)
import glob
import PIL.Image
import numpy as np
import os
from IPython.core.display import Image, display

api_address = 'http://sealsapi.southcentralus.cloudapp.azure.com:8088/'
test_image_folder = '/data/seals_blob1_test/'
with open('./seals_api_key.txt', 'rt') as fi:
    api_key = fi.read().strip()

print(requests.get(api_address).text)

%autosave 0
```



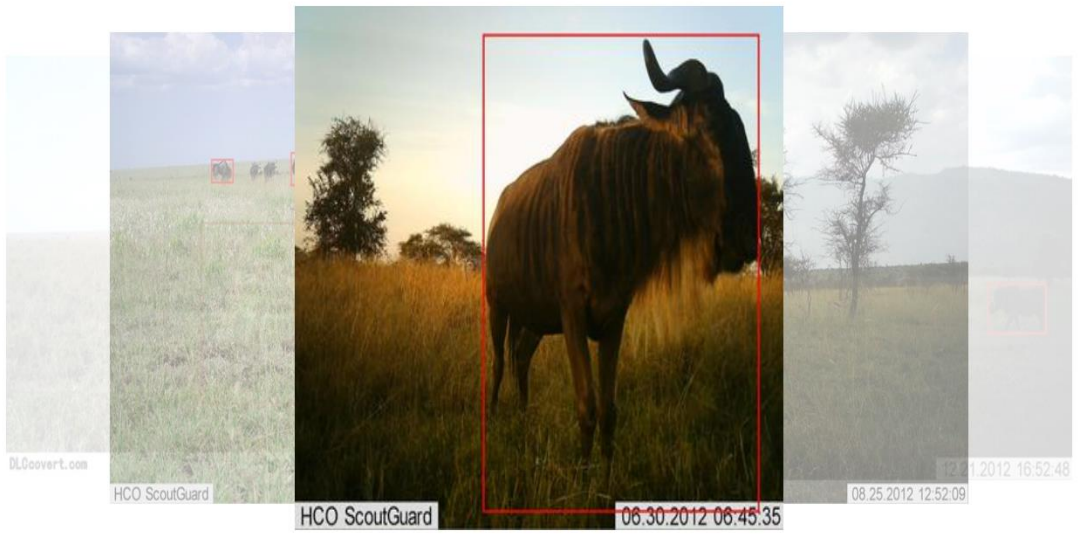
```
Health check OK


Autosave disabled
```

Retrieve and display IR image

In [4]:
```
image_path = random.choice(glob.glob(os.path.join(test_image_folder, '*_THERM-16BIT-N.PNG')))
upload_image = PIL.Image.fromarray((np.array(PIL.Image.open(image_path))/256).astype(np.uint8))
upload_image
```

NOAA FISHERIES

RESULTS



CLASSIFICATION RESULTS

Animal 1

wildebeest

99.99%

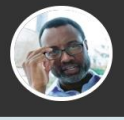
IMAGE DETAILS

FILE NAME	RESULTS	BOUNDING BOXES	PATH
S5_G04_R1_IMAG0154.JPG	✓	1	/CameraTra...
S5_L04_R2_IMAG0455.JPG	✓	3	/CameraTra...
S6_C01_R1_IMAG1806.JPG	✓	1	/CameraTra...
S1_P07_R1_PICT0370.JPG	✓	1	/CameraTra...
S1_P07_R1_PICT0996.JPG	✓	1	/CameraTra...
S5_N04_R3_IMAG0074.JPG	✓	2	/CameraTra...
S6_I01_R1_IMAG0306.JPG	✓	5	/CameraTra...
S1_M04_R1_PICT0095.JPG	✓	1	/CameraTra...
S1_R12_R2_PICT0454.JPG	✓	1	/CameraTra...
S6_C03_R1_IMAG0183.JPG	✓	1	/CameraTra...
S6_I04_R2_IMAG1275.JPG	✓	2	/CameraTra...
S5_G03_R1_IMAG1519.JPG	✓	4	/CameraTra...

WILDBOOK for Whale Sharks

Whale Shark Intelligent Agent

Researcher
Roger Harui



YouTube Video Source

https://www.youtube.com/watch?v=mn5a3XJhJd4

Process

Intelligent Agent Process

Modules	Input	Output	Status
Detect language and translate	120 Spanish	125 English	**Complete**
Text analysis and prediction	125 Words	8 Keywords	**91.12%**
Extract video keyframes	35 Seconds	18 Keyframes	**Complete**
Object detection and prediction	18 Keyframes	15 Images	**86.31%**
Extract text from video	17 Keyframes	-	**Extracting**
Determine where and when	-	-	-

Output Logs

```
[01:58:38 PM] Starting Azure Cognitive Services OCR Text Extraction. Input frames: 20
[01:58:39 PM] 01/20 - Detected: 'Buceo con Dominós' Translated: 'Diving with Dominos'
[01:58:39 PM] 03/20 - Detected: 'Buceo con Dominós' Translated: 'Diving with Dominos'
[01:58:39 PM] 05/20 - Detected: '2017-07-26'
[01:58:40 PM] 07/20 - Detected: '2017-07-26'
[01:58:40 PM] 09/20 - Detected: '2017-07-26'
[01:58:40 PM] 011/20 - Detected: '2017-07-26'
[01:58:40 PM] 013/20 - Detected: '2017-07-26'
```

Next

Diving with Dominos

24 views

2 0 SHARE

Nuria Gonzalez
Published on Sep 26, 2017

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What an amazing experience swimming with the worlds biggest fish. Last month I was graced by this polka-dotted gentle giant. Best dive ever! Whale Sharks are my new favorite!

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2 Comments SORT BY

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Arturo Lopez 1 year ago
sister, what an amazing experience. I'm jealous

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through energy storage & grid integration R&D

60% Renewable Energy & Growing Globally

through policy, partnerships & procurement

Driving Industry Transformation

through new platforms, services & programs


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